**Appendix 1: Possible ACHLMA Land Management Activities**

These tables provide examples of possible land management activities, their methodologies and indicative ground disturbance. They may help as a starting point for developing the permitted land management activities.

|  |
| --- |
| 1. **Fire Prevention, Preparedness, Rehabilitation**
 |
| **Activity class** | **Tasks** | **Methodology & equipment** | **Ground Disturbance** |
| **Fire prevention / planned burning** | Fuel reduction or ecological burns | Manual ignition | No |
| Fuel break / mineral earth break construction | Clear vegetation by mechanical means (slashing or mowing) generally within a 15-20m strip. | Yes (passage of vehicle) |
| Clear vegetation by chemical application generally within a 15-20m strip. |  |
| 1. Using an excavator, scrape earth and remove biofuel to create fuel break2. Using hand tools (rake hoes) scrape earth and remove biofuel to create fuel break3. Using a tractor with attachment, slash / cut grass to create fuel break | Yes- up to 20cm |
| Closure and rehabilitation of temporary fire control lines | Cut cross drains at intervals across the control lineRestore natural slope and land profile with topsoil (spoil) as much as possibleDrag back vegetation over restored slopeCross drains spaced according to grade and soil erodibility | Yes- depth will depend on degree of slope |
| Post burn survey | Pedestrian survey | No |
| **Stockpile burn** | 1. Create stockpile2. Stoke to burn3. Extinguish fire4a. Remove remaining material; or4b. Bury burnt material | 1-4a. Excavator to create stockpile and stoke burn, remove burnt material with bucket to load material onto truck.1-4b. Excavator to create stockpile and stoke burn, excavator to dig holes and bury. | Yes- during stockpiling and digging of hole |

|  |
| --- |
| 1. **Road and Track Maintenance: Sealed, Unsealed, Vehicle, Cycling and Walking**
 |
| **Activity Class** | **Tasks** | **Methodology & equipment** | **Ground disturbance** |
| **Drainage maintenance** | Restore crossfall (Road/track surface shaping to maintain profile) | Crown or slope road/track surface to enable water to flow freely from the road surface, using a bulldozer or grader. | YesUp to 100mm, within existing footprint of road/track |
| Drainage infrastructure maintenance | Includes:• clearing existing culvert pipes under roads.• removal of soil build-up in roll over drains.• removal of soil build-up in drainage run-offs.• removal of soil build-up and surface debris in table drains.With a bulldozer, grader, backhoe, or using hand toolsClean either by grader or using handtools.Cut / recut if required to ensure an adequate outlet velocity and prevent the pooling of water within the drain.Installation of erosion and sediment control measures such as rock beaching and other such products by hand or machinery. | Yes |
| New culvert installation | Dig trench across road, place culvert pipe in trench, back fill with soil from trench. | YesDepth of trench dependent on culvert size. |
| Culvert replacement | Dig trench across road, remove redundant pipe, place new culvert pipe in trench, back fill with soil from trench. | YesExisting footprint used |
| Alpine Drain | Using hand tools or grader, use soil to build up large ‘speed hump’ and drainage channels that will divert water off track. | YesExisting footprint used |
| **Road/Track Maintenance/Repair** | Rolling of road/track surfaceWater crossing/ford maintenance and replacement | Compaction of road surface (after grading) using a rubber or steel drum roller (type 10 tonne or equivalent) (which may be vibrating) – minimum of 4 passes.Grade road to depth required to repair road surface and surface defects, including: rutting, corrugations, drainage scours, rough surface, potholes, excessive loose surface material, restore crossfall, remove trees/other debris from road. | Yes, existing footprint used (minimum initial cut of 50mm), grader with ripper, roller 10-12 tonne. |
| Repair road surface defects including rutting, corrugations, drainage scours, rough surface, potholes and excessive loose surface materials. | Grade road to a depth required to suitably repair road surface and remove corrugations or other surface imperfections using a Caterpillar 12H or equivalent grader. Potholes are ripped and the road reformedRolling of road surface immediately after grading using a 10 tonne roller or equivalent.Spread gravel where required for patch gravellingThe main focus of works is the full width of the road from the top of the cut batter/s to the bottom of the fill batter/s. The top batter is only to be treated where safe and practicable to do so. | Yes |
| Gravelling of road surface | Dump load of gravel and spread onto existing road surface using a grader or bulldozer.Re-shaping of road pavement depending on road condition; andPatch gravelling, repair to sections of the road surface | LikelyPassage of vehicle – up to 20mm, within existing footprint of road/track. |
| Rolling of road surface | Compaction of road surface (after grading) using a rubber or steel drum roller (type 10 tonne or equivalent) (which may be vibrating) – minimum of 4 passes. | Yes |
| Includes: using spill from grading and/or surrounding fallen vegetation to block off unofficial tracks |  |
| Closure of track/road | Includes: using spill from grading and/or surrounding fallen vegetation to block off unofficial tracks | Possible |
| **Walking / Cycling** | Installation and maintenance of safety barriers and handrails | Generally, occurs within existing constructed footprint of a pathway / track.  | Generally, within existing constructed footprint of pathway / track |
| Repair/replacement of boardwalkSlashing and mowing where necessary |  |  |
| Road/Track Realignment / widening (less than 100m)Clearing of track |  |  |
| Closure of track/road (unofficial and official) | Includes: using spill from grading and/or surrounding fallen vegetation to block off unofficial tracks |  |

|  |
| --- |
| 1. **General Maintenance**
 |
| **Activity Class** | **Task** | **Methodology & equipment** | **Ground disturbance** |
| **Erection of signage, fences and gates** | Sign installationInstallation of gateInstallation of bollardsReconstruction/repair of platforms | 1. excavate hole/s2. place signpost/s in hole/s3. secure sign by replacing removed soil or using concreteManual or mechanical excavation of hole (auger attachment on a machine or by post-hole shovel) | YesHole ~30cm x 30cm diameter, ~50cm deep |
| Fence erection/pile fields/survey marker installation | 1. Excavate post holes2. Install posts and gates3. Secure postsManual or mechanical excavation of holes (auger attachment on a machine or by post hole shovel), install posts and secure using concrete | Yes |
| Ground preparation - hole excavation | Hole excavation – shovel | Yes(Depending on how far the shovel is pushed into the ground) |
| **Litter removal** | Removal of rubbish and debris (1)Removal of rubbish and debris (2) | Excavator to pick up material and place in truck, may involve scraping of topsoil (use of bucket to load material onto truck).Manual pick up | PossibleNo |
| **Pest Animal control** | Spraying of wasp/bee nests | Hose and rigs on utes/trailers/small trucks; handheld tools | Possible (passage of vehicle- up to 20mm) |
| Baiting | Plough baiting trail lines with a tractor, lay bait | Yes (passage of vehicle. Bait trail width-up to 20cm depth- 5-10cm) |
| Habitat removal- warren ripping | Ripping ground hollows with a tractor + ripping tinesTwice ripping the earth in which a warren is located and the earth 4m beyond each warren entrance, where the individual rip lines are not more than 50cm apart and not less than 50cm deep and where the second rip is made at right angles to the first rip | Yes |
| Habitat removal- warren fumigation | Apply fumigation product to a warren and make the warren inaccessible to rabbits by block and seal all entrances to the warrenHose and rigs on utes/trailers/small trucks; handheld tools | Possible |
| Habitat removal- harbour removal, warren exposure and blockage | 1. Using forestry groomer or similar with low ground pressure, groom ground surface no deeper than 60cm to remove harbour. 2. Using hand tools, cover warrens and track marks with spoil to assist with minimising re-entry into warrens.3. warrens can be assessed for in situ Aboriginal cultural heritage prior to covering of entrances. | Yes (passage of vehicle and grooming- up to 60 cm) |

|  |
| --- |
| 1. **Erosion Control**
 |
| **Activity Class** | **Tasks** | **Methodology & equipment** | **Ground Disturbance** |
| **Erosion control (mechanical)** | Re-shape area by removing / adding soil to improve drainage or stabilise soil | Excavator and/or bobcat to remove/fill soilBank battering- decrease steepness. | Yes |
| Install erosion matting | Pin down jute mat or weed matting over an area of groundTent pegs or similar used | Yes – depending on peg size |
| Construct retaining wall using rock, timber, concrete or sandbags. | 1. Dig out embankment2. Dig two post holes3. Install metal supports4. Install concrete sleepers | Yes |
| Installation of rock beaching and geofabric material and similar geotechnical treatments. | Earthmoving equipment (excavators, bobcats etc.) to shape area and install rock beaching material. | Yes |

|  |
| --- |
| 1. **Revegetation and vegetation maintenance**
 |
| **Activity Class** | **Tasks** | **Methodology & equipment** | **Ground disturbance** |
| **Planting / Revegetation** | Ground preparation – rip lines | Rip lines with tractor-mounted ripping tines/plough(Tines under 60cm) | Yes |
| Ground preparation – scalping topsoil | Excavator / bulldozer scraping soil from the surface | Yes (15+ cm topsoil removed) |
| Ground preparation - hole excavation (1) | Hole excavation – Hamilton planter | Yes (Planting depth is determined by how far the planter is pushed into the ground- 125-180mm) |
| Ground preparation - hole excavation (2) | Hole excavation - mattock | Yes (depending on blade length) |
| Ground preparation - hole excavation (3) | Hole excavation – shovel (aquatic planting) | Yes(Depth determined by how far the shovel is pushed into the ground) |
| Install weed suppression matting | Pinning down jute mat(Tent pegs or similar used) | Yes |
| Install bamboo / hardwood stakes | Hammer in stakes | Yes(Depth determined by how far the stake is pushed into the ground) |
| Watering | Using a hose to water vegetation from water truck/cart/pump/creek | No |
| **Vegetation maintenance** | Weed spraying (1) | By vehicle - spray using a hose and rig on a ute trailer/quad bike | Possible(Passage of vehicle) |
| Weed spraying (2) | On foot – using a backpack, spot spray to avoid native grasses/plants | No |
| Cut and paint at stump  | Cut and paint at stump (root ball left in situ). On foot – using a backpack and hand tools | No |
| Soil solarisation | Pin down jute mat or weed matting, black polythene over an area of ground(Tent pegs or similar used) | Yes |
| Brush-cutting | On foot - using a hand-held brush cutter | No |
| Grass cutting - Mechanical (1) | Using a ride-on mowerUsing a tractor with attachment – e.g. flail mower, tractor slashing | Possible(Passage of vehicle) |
| Road edge vegetation slashing | Slashing vegetation using tractor and slasher or mower | PossiblePassage of vehicle – up to 20mm, within existing footprint of road/track |
| Road edge scrub removalClearing of vegetation in general | Remove vegetation from both sides of the road margins. Methodology and equipment used determined within the limitations of safety, machine capabilities and scrub density.Removal of vegetation (including root ball) – using a bulldozer or grader (grader of type Caterpillar 12H or equivalent – minimum size) | YesUp to 100mm, within existing footprint of road/track |
| Hazardous tree management | Pruning and lopping of hazardous tree limbs for public safety. Equipment often includes cherry picker / elevated work platform, chainsaws, pole saws, and chipper truck.  | Possible, from machinery |
| Install weed suppression matting | Pinning down jute mat(Tent pegs or similar used) | Minimal |
| **Tree removal (mechanical)** | Cut and remove trees at base (1) | Felling/ripping out branches and trunks with machinery such as an excavator, skid steer or crane. | Yes |
| Cut and remove trees at base (2) | ChainsawDrilling / frilling(Root ball left in situ) | No |
| Remove fallen trees | Using excavator, grinder and chains/ropes to lift and drag trees along creek bank to a chipper/tub grinder or stockpile to burnDozer tree pushing | Yes(Passage of vehicle) |
| Push / pull tree | Remove tree by pushing or pulling it with a bulldozer or excavator, chainsaw, roping – ripping out rootsMethodologies include ripping/digging roots; constructing an earth ramp to provide greater leverage in the push, or constructing an earth platform to assist an excavator push | Yes(Passage of vehicle. Root ball removed) |
| 1. Groom2. Spray | Grooming of material down to the stump, using an excavator or skid steer with grooming attachment, followed by spraying. Hand/mechanical removal of willows for bank stability and ensure water flow | Possible(Passage of vehicle. Root ball left in situ) |
| Forest inspections, biodiversity activities/fieldwork |  | No |
| **Mulching** | 1. Bring mulch in2. Unload mulch3a. Spread mulch using machinery3b. Spread mulch by hand | Trailer or tray truck3a. Excavator or skid steer to distribute and spread stockpiled mulch3b. Using hand tools (rakes), distribute and spread stockpiled mulch | Minimal |

|  |
| --- |
| 1. **Waterway Management**
 |
| **Activity Class** | **Tasks** | **Methodology &equipment** | **Ground Disturbance** |
| **Environmental habitat logs** | Install logs in waterways to provide habitat | In-stream and bank holes machine dug, pinning logs to the soil surface | Yes |
| **Sediment fences** | 1a. Install sediment fences/booms across waterway mechanically1b. Install sediment fences/booms across waterway manually2. secure sediment fences/boomsSediment extraction from catchment/waterways. | 1a. Install stakes or pickets to secure. Excavation to ‘key’ in logs using an excavator, or pickets.1b. Install stakes or pickets using hand tools. | Yes |
| **Water point maintenance** | Clear existing dams.Sediment extraction of sediment ‘slugs’ within catchment | Remove soil and debris using an excavator or backhoe | YesPassage of vehicle |
| Clearing of debris using hand tools or machinery | Yes. Passage of vehicle and debris.  |